2

INSTALLING WINDOWS XP PROFESSIONAL

> **After reading this chapter and completing the exercises, you will be able to:**
> ♦ Understand how to install and upgrade Windows XP Professional
> ♦ Plan an installation or upgrade
> ♦ Install Windows XP using a CD-ROM or the network
> ♦ Understand the installation process
> ♦ Describe the advanced installation options
> ♦ Remove Windows XP Professional

Anumber of issues must be considered when installing any operating system (OS), and Windows XP Professional is no exception. This chapter details the various steps that must be taken to get Windows XP up and running. It also examines such issues as whether to perform a fresh installation or to upgrade from an earlier version. It covers the various methods used to install Windows XP (CD-ROM or network-based), as well as a few things to watch out for along the way.

Windows XP has broader hardware support than Windows 2000, but you must still verify that your hardware is included in the Hardware Compatibility List (HCL), which can be downloaded from Microsoft's Web site at *www.microsoft.com/hcl*. Before installing Windows XP Professional, you must first ensure that your computer meets the minimum requirements (and, preferably, the recommended requirements), as detailed in Chapter 1, "Introduction to Windows XP Professional," and that all hardware to be used with Windows XP is listed on the HCL.

UPGRADING VERSUS INSTALLING

When installing Windows XP Professional, you have a choice between upgrading an exist-ing installation or performing a completely clean installation. Upgrading is an option when you have a version of Windows already installed and want to preserve some settings and other information from the previous installation, including password files, desktop settings, and general configuration. A **clean installation** installs a completely new version of Windows XP Professional without regard to any existing files or settings.

Windows XP Professional can be installed as an **upgrade** over an existing installation of the following operating systems:

- Windows 95 OSR2, Windows 98, Windows 98 SE, and Windows Me
- Windows NT 4.0 Workstation (with Service Pack 6 or later)
- Windows 2000 Professional (with any service packs)
- Windows XP Home

> **Note**
> You can upgrade from Windows 95. However, because Microsoft no longer supports Windows 95, it is effectively off their radar. The upgrade won't retain as much information as an upgrade from Windows 98, but it is possible.

To migrate from any other OS not included in this list requires a full or clean installation. This means that Windows NT Server, Windows 2000 Server, and Windows 3.1 are "upgraded" only by a clean installation that overwrites them instead of retaining data.

Typically, you'd select an upgrade installation when you want to retain your existing desktop, system settings, and network configuration. If you are having problems with your existing OS and the environmental settings are not that important, a clean instal-lation is a better option. A clean or complete installation can be performed onto a sys-tem with a blank hard drive, over an existing OS, or in such a way as to create a multi-boot system. A **multi-boot system** is a computer that hosts two or more oper-ating systems that can be booted to by selecting one from a boot menu or boot man-ager each time the computer is powered up.

The process of upgrading to Windows XP Professional from Windows 2000 Professional is fairly straightforward, having been designed to retain as many of the existing config-uration and software settings as possible. The only items that will not be retained are sys-tem utilities or drivers specific to the existing OS that are updated or removed for Windows XP. To upgrade, launch **WINNT32** from the \I386 folder on the CD, then select the upgrade option from the pull-down list (see Figure 2-1). Try Hands-on Project 2-5 to practice upgrading.

Figure 2-1   Choosing the upgrade option from the Windows Setup Wizard

BOOTING MULTIPLE OPERATING SYSTEMS

It is possible to install more than one OS on the same computer, allowing you to choose the OS to be used at boot time. Unless you deliberately overwrite, or **format**, the **partition** or volume (a space set aside on a disk and assigned a drive letter that can occupy all or part of the disk) where another OS is located, installing Windows XP Professional will not affect the other OS.

Windows XP can be dual-booted with any Microsoft OS and even OS/2. You can create a **dual-boot system** with Windows XP and other operating systems, such as Linux. However, these operating systems require third-party boot and partition managers such as Partition Magic from PowerQuest (*www.powerquest.com*) or System Commander from V Communications (*www.v-com.com*).

In most cases (when third-party multi-boot software is not used), you'll want to install Windows XP on a system with an existing OS rather than installing Windows XP before another OS. This enables the Windows XP Setup routine to configure the boot loader properly. The **boot loader** is the software that shows all currently available operating systems and permits the user to choose which one should be booted through a menu. At boot time, you can choose the OS you want to run, as shown in Figure 2-2.
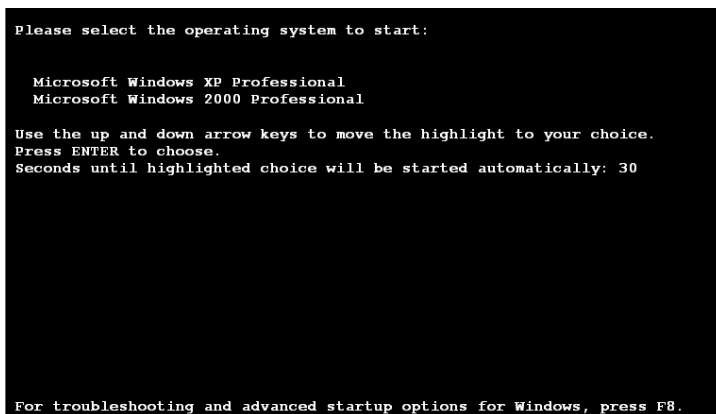
Figure 2-2 The Windows XP Professional boot menu

> **Note**
>
> The **BOOT.INI** file is a text file that creates the Windows XP boot loader's menu. To remove an OS from the boot loader or edit its entry in the boot loader menu, you have to edit the BOOT.INI file manually. If you plan on making changes, it's always a good idea to create a backup of the original in case you cause an error. Additionally, the Startup options in Control Panel can also be used to modify these parameters in Windows NT and 2000, as discussed in Chapter 3.

If you plan to use more than one OS, it's important to consider which **file system** to use and whether data must be accessible to more than one OS on the same machine. Windows XP can be installed on a FAT (File Allocation Table), FAT32, or an NTFS (New Technology File System) partition (FAT, FAT32, and NTFS are covered in Chapter 1, "Introduction to Windows XP Professional," and Chapter 4, "Managing Windows XP File Systems and Storage"). Only NTFS supports the majority of the Windows XP file security features, but a partition formatted with NTFS will be invisible to other operating systems that don't support NTFS. If you want to share data between operating systems on the same computer, you'll need to create a FAT or FAT32 volume.

PLANNING THE INSTALLATION

Careful planning is essential for the smooth installation of any OS. The importance of checking hardware against the HCL was discussed in Chapter 1, but that's only the beginning. It's also important to consider the following:

- The type of installation you want to perform, such as attended or unattended
- The partition on which the OS files will be stored and how that partition is to be formatted

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Your computer must meet Microsoft's minimum hardware requirements before you attempt an installation. Otherwise, you'll be unable to install the OS properly and will waste a significant amount of time. (See Chapter 1 for a review of the hardware requirements.) The Setup routine performs a system check during installation. If your system fails to meet the minimum requirements, Setup is terminated automatically.

Windows XP Professional can be installed onto a multiprocessor system that hosts two CPUs. The installation routine automatically configures the system to use multiple CPUs if they are present on the system. However, if you install Windows XP Professional with a single CPU and later add a second CPU, you must reinstall Windows XP or perform an upgrade installation. This is necessary to update the hardware-specific HAL (motherboard, CPU, and so on) for multiprocessor support (see Chapter 1 for additional information about the HAL).

You can perform an upgrade installation if your situation meets all of the following conditions:

- The current OS is supported as a platform that Windows XP Professional can upgrade.

- You want to replace your current OS with Windows XP, retaining as much configuration and setting information as possible.

- You are prepared to handle possible problems or incompatibilities caused by hardware and software under Windows XP that might not be present under the current OS.

You can perform a clean or full installation if at least one of the following is true:

- Your system has a freshly formatted hard drive, or a new blank hard drive has just been installed.

- You want to install Windows XP over your existing OS, but that OS is not on the list of operating systems that support upgrading to Windows XP.

- You want to replace your existing OS with Windows XP.

- You want to create a dual-boot or multi-boot configuration with the existing operating system(s) and Windows XP.

Types of Installations

For attended (manual) installations (unattended installations are covered in a later section), you have a choice between a CD-ROM installation and a network installation. Use the method that grants the fastest access to the distribution files, meets your current OS and network capabilities, and complies with your organization's deployment policies. If you have a local CD-ROM drive, this is usually faster than pulling the files from a network share. Furthermore, the installation proceeds faster if you can boot from the CD

rather than starting from an existing OS, or even using the boot floppies. Microsoft has created many options to launch the Setup procedure to ensure that at least one method is available to any computer system. Alternately, you can copy the contents of the Windows XP Professional CD to a local drive with sufficient space and perform the installation from a local folder, as opposed to a CD-ROM or a network share.

Installing over the Network

Performing a network installation simply means launching the Setup routine from a network share instead of a local device. To install Windows XP Professional over the network, you must have an existing OS (or a boot floppy) with network connectivity and access privileges to the Windows XP Professional distribution files through a network share (whether that share is a shared CD-ROM drive on a server or a copy of the files on a server's hard drive). The subdirectory that contains the installation files is the \I386 folder on the Windows XP CD-ROM. Set the general access permissions (i.e., the Everyone or the Domain Users group) on this share to Read-only by executing the **WINNT** or WINNT32 command (see later this chapter for more details). Some systems allow this command to be executed through My Network Places or Network Neighborhood; other systems support the use of a UNC name (*servername*\I386\WINNT32); still other systems require that you map a drive to the network share first. Hands-on Project 2-1 gives step-by-step instructions for installing Windows XP Professional over the network.

> **Note**
> From DOS (and operating systems installed over DOS), drive letters are mapped using the command-line syntax of `net use x: \\servername\ directory` (where *x* is the drive letter to which you want to map the shared network directory, *servername* is the name of the server on which the files are stored, and *directory* is the name of the installation directory). On Windows 95, 98, and NT, drive letters are mapped using the Tools|Map Network Drive command from Windows Explorer.

CD-ROM Installation Launched from Setup Boot Floppies

Another common installation method is using the **set-up boot disks** (or **floppies**) to initiate the installation from a local CD-ROM drive. This is the preferred method if you must install storage drivers manually, when an existing OS is not present, or when network access is not available. To initiate this process, place the Windows XP Professional CD-ROM into an HCL-compliant CD-ROM drive, place the first of the set-up boot floppies in the floppy drive, then reboot the system. You'll be prompted to insert each floppy in turn.

Bootable CD-ROM

The Windows XP Professional CD-ROM is self-booting. Thus, if your computer hardware supports this feature, you can bypass the set-up floppies by allowing the computer to boot off the CD-ROM. This method is faster than the floppy method, and is the most common installation method for individual installations. This method can be used regardless of the presence of an OS on the system or network access.

If your system supports bootable CD-ROMs, it is often a good idea to eject all bootable CDs before rebooting your system. This is especially true if your system automatically boots from bootable CDs instead of prompting you to press a key to boot from the CD upon the initial POST (Power On Self Test). In most cases, it is a good idea to disable bootable CD-ROMs through your CD-ROM controller's BIOS after you've installed Windows XP.

CD-ROM Launch from Existing OS

The Setup process can be launched from an existing OS or from a boot floppy that contains CD-ROM drivers. Launching Setup requires the execution of the WINNT (DOS or Windows 3.x) or WINNT32 (Windows 95, 98, NT, 2000, XP) file from the \I386 directory (see later this chapter for details on WINNT and WINNT32 commands).

Creating Setup Boot Floppies

If the set-up boot floppies aren't available, you can create new ones. The utility to create the boot floppies can be downloaded from *www.microsoft.com/downloads/ release.asp?releaseid33291*. Just launch this utility, follow the prompts, and insert the blank floppies when instructed to do so.

IMPORTANT SETUP OPTION DIFFERENCES

Launching setup using the various methods mentioned in the previous section results in one of two setup initializations. To make discussion of these two setup initializations a little easier, we'll label the former the text mode setup method and the latter the GUI setup method.

The text mode setup method is discussed in detail a little later in this chapter. In fact, you will perform a complete walkthrough of this method.

The GUI setup method employs an initialization Setup Wizard to preselect or predefine several setup options. The first option is whether to perform an upgrade installation or a clean installation (see Figure 2-1). An upgrade installation retains as much of the existing system information as possible. A clean installation completely ignores all existing settings. If you perform an upgrade installation, the Wizard prompts you to read and agree to the license agreement, then it copies the required files to the hard drive before rebooting the system. Once rebooted, setup runs through the text-only portion without prompts, then proceeds to the GUI portion.

If you elect to perform a clean installation, the Wizard prompts you to read and agree to the license agreement and provide the product key, then prompts you to change setup options. The Setup Options page of the Windows Setup Wizard offers an Advanced Options button, an Accessibility Options button, and a primary language selection pull-down list. The primary language selection is used to set the base language and region

for the system. Accessibility Options are used to enable the magnifier and narrator options for use during setup. Advanced Options are used to set the following options:

- Source path (default is <cdrom_drive>:\I386)
- Systemroot name (i.e., where Windows XP will be installed; the default is \WINDOWS)
- Whether to copy all files from CD before rebooting
- Whether to allow manual selection of destination partition during setup

> **Tip** Mark the checkbox that allows you to select the destination partition manually during setup. Otherwise, setup automatically selects the first partition on the first drive in the system. This location is not always the best choice, especially if you are creating a multi-boot system.

Then setup prompts whether you want to upgrade the drive (i.e., format the destination partition) with NTFS. Next, setup asks whether you want to download updated setup files from the Microsoft Web site to use for the installation (a.k.a. Dynamic Update). If you have Internet access, this can save you time later. Finally, setup copies required files to your hard drive, then reboots the system. Once rebooted, setup starts the text-only portion and continues in much the same manner as the text mode setup method. However, the prompts that have been predefined will be skipped.

Dynamic Update is a new feature added to the installation process in Windows XP that enables setup to download updates and patches for Windows XP before installation actually begins. Thus, once installation is completed, the resulting system will be fully up-to-date with all downloadable updates. Dynamic Update downloads the same components offered by the Windows Update tool.

ADVANCED INSTALLATION OPTIONS

As the number of clients that need Windows XP installed increases, attended installations become less appealing. Windows XP supports both unattended and customized installation options, both of which are used often in enterprise network deployments. Both options require significant system and setup script preparation and pre-configuration, most of which are automation options. This means the installation of Windows XP can be configured to require little or no human interaction. If you are deploying hundreds or thousands of clients, using one or more unattended installation techniques can greatly reduce the time required to complete the task.

Unattended installations proceed in much the same manner as an attended installation, except that an **answer file** is used to provide the responses to all the setup prompts. In addition, an answer file can be used to install additional applications after the OS installation is complete.

Custom installations are modified versions of Windows XP designed to fit a specific hardware or software configuration. Custom installations can also employ an answer file to provide system-specific answers to the customized installation.

The following sections discuss the various means by which an installation can be automated and customized. However, planning and managing an enterprise deployment of Windows XP is a complex undertaking. For more information on enterprise deployment, consult the *Microsoft Windows .NET Server Resource Kit Deployment Planning Guide* from Microsoft Press.

Automated Installations

Windows XP offers an automated installation option through the use of an answer file, a process known as **unattended installation**. This installation method is often preferred in multiple installations because you don't have to respond to installation prompts, but instead provide a script containing the appropriate answers. Although it can take a little time and practice to set up an unattended installation, it can save time if you must install Windows XP on several machines. Windows XP further simplifies multiple duplicate installations with the **uniqueness database file (UDF)**. The UDF works in conjunction with the answer file, allowing you to override some settings in the answer file to further streamline the unattended installation process. Rather than creating a new answer file for every change to the installation, you can just specify a separate UDF. Most information is covered in the answer file, but if a setting exists in both the specified UDF and in the answer file, the UDF takes precedence.

Unattended Installations

To initiate an unattended installation, execute WINNT with the /U and /S options, or WINNT32 with the /UNATTEND and /S options. This instructs setup to perform an unattended installation using the files stored in the location you specify with the /S switch. To further customize the installation, you can use a UDF in combination with an answer file (the file that provides answers to installation prompts for unattended installations; the default sample is called UNATTEND.TXT) by specifying /UDF on the setup command line.

> If you are planning to perform a clean installation on a computer that does not have an operating system installed, and you want to install from a CD-ROM in unattended mode, the name of the answer file must be Winnt.sif. This file has the same sections and entries as UNATTEND.TXT. To install from a CD-ROM, the computer must also be configured with El-Torito No Emulation CD-ROM boot support, and the Winnt.sif answer file must be available on a floppy disk.

The \I386 directory on the Windows XP Professional CD-ROM contains a file called UNATTEND.TXT that is used for configuring unattended installations on that type of platform (it's the answer file we've been discussing). If you must install several copies of

Windows XP Professional that vary slightly (for example, the user name differs), you can use a UDF to supplement the answer file and override its parameters as needed.

The UNATTEND.TXT file included with Windows XP Professional contains default settings for a typical installation as follows:

```
; Microsoft Windows XP Personal, Professional, Server,
Advanced Server and Datacenter
; (c) 1994 -
 2000 Microsoft Corporation. All rights reserved.
; Sample Unattended Setup Answer File
; This file contains information about how to automate the
installation
; or upgrade of Windows Codename Whistler so the
; Setup program runs without requiring user input.
;
[Unattended]
Unattendmode = FullUnattended
OemPreinstall = NO
TargetPath = *
Filesystem = LeaveAlone

  [UserData]
FullName = "Your User Name"
OrgName = "Your Organization Name"
ComputerName = *
ProductKey= "JJWKH-7M9R8-26VM4-FX8CC-GDPD8"

[GuiUnattended]
; Sets the Timezone to the Pacific Northwest
; Sets the Admin Password to NULL
; Turn AutoLogon ON and login once
TimeZone = "004"
AdminPassword = *
AutoLogon = Yes
AutoLogonCount = 1

[LicenseFilePrintData]
; For Server installs
AutoMode = "PerServer"
AutoUsers = "5"

[GuiRunOnce]
; List the programs that you want to launch when the
machine is logged into for the first time
```

```
[Display]
BitsPerPel = 8
XResolution = 800
YResolution = 600
VRefresh = 70

[Networking]

[Identification]
JoinWorkgroup = Workgroup
```

This file can be modified either manually or with the **Setup Manager** Wizard. Complete details on how to edit this file and all of the possible syntax combinations are contained in the *Microsoft Windows XP Professional Resource Kit*, which includes the Wizard for creating or editing your own fully customized UNATTEND.TXT files. The Setup Manager Wizard is found in the DEPLOY.CAB file within the \Support\Tools directory on the distribution CD. If you are working from Windows XP, you can access the contents of the .CAB file just like any other compressed folder. Double-clicking on the setupmgr.exe file from within the .CAB file initiates an extraction process; once extracted to the location of your choice, the file can be executed from its new location. Once launched, the Setup Manager Wizard can be used to create a variety of installation scripts, including the following:

- Duplicate current system's configuration, edit an existing UNATTEND.TXT file, or create a new file from scratch

- Create uninstall scripts, sysprep installation scripts, or RIS installation scripts

- Create scripts for Windows XP Home, Windows XP Professional, Windows .NET Server, Advanced Server, or DataCenter Server

- Fully automated (no user interaction), read-only (user can view settings on each page but no changes can be made), GUI (text portion is automated), provide defaults (recommended settings are defined, but user can change during setup), or hide some configuration set-up pages

Hands-on Project 2-4 gives an example of how to create an answer file using this Wizard.

Answer Files and UDFs

You can create a UDF in a text editor such as EDIT or Notepad. It should look something like the following:

```
[UniqueIDs]
     UserID1 = Userdata,GuiUnattended,Network
     UserID2 = Userdata,GuiUnattended,Network

  [UserID1:UserData]
  FullName = "Hans Delbruck"
  ComputerName = "Monster"
```

```
[UserID1:GuiUnattended]
TimeZone = " (GMT+01:00) Prague, Warsaw, Budapest)"

[UserID1:Network]
JoinDomain = "LabTechs"

[UserID2:UserData]
FullName = "Francis N. Stein"
ComputerName = "Doctor"

[UserID2:GuiUnattended]
TimeZone = "(GMT-06:00) Central Time (US & Canada)"

[UserID2:Network]
JoinDomain = "MadScientists"
```

When you've finished the UDF, save it as a text file and store it on disk. It's often help-ful to name UDFs for the people using them, because such files are likely to be cus-tomized for individuals. More information about UDFs can be found in the *Microsoft Windows XP Professional Resource Kit* from Microsoft Press.

Remote Installation Service

The Remote Installation Service (RIS) has been expanded from its limited functional-ity under Windows 2000. When used from a Windows .NET Server, RIS can install any version of Windows XP and Windows .NET remotely, along with Windows 2000 Professional, Server, and Advanced Server (Windows 2000 DataCenter Server cannot be installed remotely with .NET Server RIS).

RIS is used to push installations over a network to a client. RIS can install Windows XP on clients that have a Dynamic Host Configuration Protocol (DHCP) PXE-based remote boot ROM, a RIS boot disk-supported **network adapter (NIC)**, or an exist-ing OS. In any case, you can completely pre-configure the installation of Windows XP so that the only action you need to perform on the client is to power it on.

RIS takes advantage of DHCP to perform system installations without requiring the installer to visit the destination system. RIS requires that DHCP, DNS, and Active Directory be present and active on a domain. To employ RIS, you perform the follow-ing steps (note: this is a high-level overview of the process, not a detailed step-by-step):

1. Verify that all systems comply with hardware requirements.

2. Install a Windows 2000 or .NET Server as a stand-alone/member server. Install Remote Installation Services as an Optional Component during the installation or after initial installation is complete.

3. If DNS is not already present in the domain, install it.

4. Promote the Windows Server to a domain controller.

5. If DHCP is not already present on the domain, install it.

6. Initiate the configuration procedure for RIS by launching RISETUP.EXE from the Run command. Using the Wizard, configure RIS for your requirements and network design.

7. Authorize RIS with Active Directory through the DHCP Manager.

8. Use the Directory Management snap-in to further configure RIS and define remote installation parameters.

As you can see, employing RIS is not a simple task. For additional details on RIS, see the *Microsoft Windows .NET Server* or the *Windows XP Professional Resource Kit*.

Microsoft has added the Windows Installer Service (WIS) to Windows XP to simplify the deployment of multiple applications onto new clients. WIS combines the set-up procedures for multiple applications into a single administrative action. WIS also centralizes application installations and simplifies the daunting task of maintaining updated software throughout a network. For more information on the Windows Installer Service, see the *Microsoft Windows .NET Server* or *Windows XP Professional Resource Kit*.

Windows XP can also be installed remotely using SMS (Systems Management Server). However, SMS can only be used to upgrade clients to Windows XP; it does not support clean installations. SMS offers a wide range of controls, including automated application installation and configuration settings control. In most cases, SMS should only be considered if it is already in use on the network; the complexity of SMS outweighs its benefits in remote client upgrade installations.

Using SYSPREP

SYSPREP is a system duplication tool used to duplicate an entire hard drive (a process often called cloning or ghosting). This tool is useful when installing Windows XP onto multiple similar systems. However, each system must have at least closely matching, if not almost identical, core hardware configurations. Basically, you'll install Windows XP onto a single computer, add all applications, and make all configuration changes. This system is the master that is duplicated to the other systems. SYSPREP cannot be used to upgrade a system; it can only be used to perform a full-image installation onto an empty partition or to overwrite an existing OS.

The SYSPREP image, if smaller than 650 MB, can be distributed on a CD as an alternative to network distribution. A CD-based SYSPREP image does not require network connectivity to complete an installation. Plus, if the client supports bootable CDs, then no OS need be present on the client.

SYSPREP enables Windows XP and installed applications to be deployed quickly on multiple computers that have the exact same hardware components. SYSPREP must be used with a third-party disk-imaging product because it only prepares a system for duplication, it does not perform the duplication. Basically, SYSPREP removes the configurable

settings of a system that are defined in a typical unattend.txt file and prepares the system to redetect all Plug and Play devices the next time the system is booted. Once the source computer or any duplicated computer is rebooted, a new SID is created automatically. The mini-setup Wizard prompts you for local system-specific data, such as computer name, product ID, and user name (the mini-Wizard can be managed through scripts to fully automate the process), and forces a full redetection of Plug and Play hardware.

To use SYSPREP, perform the following steps:

1. Install Windows XP Professional.

2. Install any additional applications, services, or drivers.

3. Customize and configure the applications and services.

4. Run SYSPREP to prepare the system for duplication. After SYSPREP completes this task, it shuts down the system.

5. Use a disk imaging or duplication product to duplicate the disk.

6. The next time the original system or any duplicated drive is booted, the Windows XP Professional installation redetects Plug and Play devices and prompts you for any information it wasn't able to obtain.

SYSPREP can be used with a sysprep.inf file, which contains the same information and uses the same structure and syntax as the unattend.txt file created by the Setup Manager.

Sysprep can be used with several command-line parameters, these are (each parameter must be preceded by a dash or hyphen when used):

- *audit*—Used only after the system is already in *-factory* mode. Reboots the system without generating new SIDs, or executing any item in the [OEMRunOnce] section of the Winbom.ini file.

- *quiet*—Disables display of confirmation dialog boxes.

- *nosidgen*—Prevents the regeneration of the security ID on reboot, should only be used when you are not cloning the current system or deploying domain controllers.

- *pnp*—Forces a full refresh of Plug and Play on next reboot, should only be used on systems with legacy and non-Plug and Play devices, Plug and Play devices do not need a forced refresh.

- *reboot*—Reboots the system after SYSPREP completes (default action of SYSPREP is to shutdown without rebooting), often used with *-factory* or to test/audit a system after preparation.

- *noreboot*—Shuts down the system but does not reboot after SYSPREP completes, this option should only be used for testing, do not use this parameter

when performing system duplications. This option forces changes to several Registry keys (SID, OemDuplicatorString, etc.), which makes the system unsuitable for duplication. Without this parameter, SYSPREP automatically shuts down without a reboot.

- *clean*—Removes all entries from the critical devices database which is referenced by the [SysprepMassStorage] section of a sysprep.inf file.

- *forceshutdown*—Forces a shutdown of the system after SYSPREP completes, this parameter should be used on systems with an ACPI BIOS that will not shut down properly using the default SYSPREP processes.

- *factory*—Places the OS into factory mode where custom pre-installations of software, updated drivers, changes to the file system, edits to the Registry, etc. can be made. After customization is complete, use the -*reseal* parameter. See the Microsoft Windows XP OEM Preinstall Kit (OPK) Web site at *www.microsoft.com/oem/* for details.

- *reseal*—Used after -*factory* parameter has been used and a system customized, reseal prepares the OS for deployment on customer systems.

- *mini*—Configures the system to use a mini-setup wizard instead of Windows Welcome upon next reboot. This parameter only has an effect on Windows XP Professional, not Windows XP Home.

- *activated*—Does not reset the grace period for Windows product activation. This parameter should be used only if XP was activated before duplication.

For details on using SYSPREP, see the *Microsoft Windows XP Professional Resource Kit*.

WINNT AND WINNT32

Earlier in this chapter there were a number of references to WINNT, WINNT32, and some of the switches that can be used with them. You might be wondering, however, what the difference is between them, why you'd use each one, and what the complete set of switches is for each command. The function of these two command-line tools has changed since their use in Windows 2000 and Windows NT. In Windows XP, they each have a unique and specific purpose.

WINNT, the 16-bit setup tool, is designed to be launched from DOS and operating systems that rely upon DOS (such as Windows 3.x and Windows for Workgroups 3.x). WINNT is designed for standard and automated installations with few additional options. The command line syntax for the WINNT command is (this material is taken from the online help information obtained from the "winnt /?" command):

```
WINNT [/S[:sourcepath]] [/T[:tempdrive]] [/U[:answer_file]
] [/UDF:id[,UDF_file]] [/R:folder] [/RX:folder]
[/E:command] [/A]
```

- /S[:sourcepath]—Specifies the source location of the Windows XP files. The location must be a full path of the form x:\[path] or \\server\share[\path]. The default is the current folder.

- /T[:tempdrive]—Directs setup to place temporary files on the specified drive and to install Windows XP on that drive. If you do not specify a location, Setup attempts to locate a drive for you.

- /U[:answer_file]—Performs an unattended setup using an answer file (requires /S). The answer file provides answers to some or all of the prompts to which you normally respond during setup.

- /UDF:id[,UDF_file]—Indicates an identifier (id) that setup uses to specify how a Uniqueness Database File (UDF) modifies an answer file (see /u). The /udf parameter overrides values in the answer file, and the identifier determines which values in the UDF file are used. If no UDF_file is specified, setup prompts you to insert a disk that contains the $Unique$.udb file.

- /R[:folder]—Specifies an optional folder to be installed. The folder remains after setup finishes.

- /Rx[:folder]—Specifies an optional folder to be copied. The folder is deleted after setup finishes.

- /E—Specifies a command to be run at the end of the GUI-mode portion of setup.

- /A—Enables accessibility options.

WINNT32, the 32-bit setup tool, is designed to be launched from 32-bit operating systems (such as all versions of Windows 95, 98, NT, 2000, Me, and XP). WINNT32 is designed for standard and automated installations and offers several options for source and destination locations as well as debug logging. The command line syntax for the WINNT32 command is as follows (this material is taken from the online help information obtained from the "winnt32 /?" command):

```
winnt32 [/checkupgradeonly] [/cmd:command_line]
[/cmdcons] [/copydir:i386\folder_name]
[/copysource:folder_name] [/debug[level]:[filename]]
[/dudisable][/duprepare:pathname] [/dushare:pathname]
[/m:folder_name][/makelocalsource] [/noreboot]
[/s:sourcepath] [/syspart:drive_letter]
[/tempdrive:drive_letter] [/udf:id [,UDB_file]]
[/unattend[num]:[answer_file]]
```

- /checkupgradeonly—Checks your computer for upgrade compatibility with Windows XP. If you use this option with /unattend, no user input is required. Otherwise, the results are displayed on the screen, and you can save them under the filename you specify. The default filename is Upgrade.txt in the *systemroot* folder.

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- /cmd:*command_line*—Instructs setup to carry out a specific command before the final phase of setup. This would occur after your computer has restarted and after setup has collected the necessary configuration information but before setup is complete.

- /cmdcons—Installs the Recovery Console as a startup option on a functioning computer. The Recovery Console is a command-line interface from which you can perform tasks such as starting and stopping services and accessing the local drive (including drives formatted with NTFS). You can use the /cmdcons option only after normal setup is finished.

- /copydir:i386*folder_name*—Creates an additional folder within the folder in which the Windows XP files are installed. *Folder_name* refers to a folder that you have created to hold modifications just for your site. For example, you could create a folder called Private_drivers within the I386 source folder for your installation and place driver files in the folder. Then you could type /copydir:i386\\Private_drivers to have setup copy that folder to your newly installed computer, making the new folder location *systemroot*\\Private_drivers. You can use /copydir to create as many additional folders as you want.

- /copysource:*folder_name*—Creates a temporary additional folder within the folder in which the Windows XP files are installed. *Folder_name* refers to a folder that you have created to hold modifications just for your site. For example, you could create a folder called Private_drivers within the source folder for your installation and place driver files in the folder. Then you could type /copysource:Private_drivers to have setup copy that folder to your newly installed computer and use its files during setup, making the temporary folder location *systemroot*\\Private_drivers. You can use /copysource to create as many additional folders as you want. Unlike the folders /copydir creates, /copysource folders are deleted after setup completes.

- /debug[*level*]:[*filename*]—Creates a debug log at the level specified, for example, /debug4:Debug.log. The default log file is C:*systemroot*\\Winnt32.log, and the default debug level is 2. The log levels are as follows: 0 represents severe errors, 1 represents errors, 2 represents warnings, 3 represents information, and 4 represents detailed information for debugging. Each level includes the levels below it.

- /dudisable—Prevents Dynamic Update from running. Without Dynamic Update, setup runs only with the original setup files. This option disables Dynamic Update even if you use an answer file and specify Dynamic Update options in that file.

- /duprepare:*pathname*—Carries out preparations on an installation share so that it can be used with Dynamic Update files that you downloaded from the Windows Update Web site. This share can then be used for installing Windows XP for multiple clients.

- /dushare:*pathname*—Specifies a share on which you previously downloaded Dynamic Update files (updated files for use with setup) from the Windows Update Web site, and on which you previously ran /duprepare:*pathname*. When run on a client, specifies that the client installation makes use of the updated files on the share specified in *pathname*.

- /m:*folder_name*—Specifies that setup copies replacement files from an alternate location. Instructs setup to look in the alternate location first, and if files are present, to use them instead of the files from the default location.

- /makelocalsource—Instructs setup to copy all installation source files to your local hard disk. Use /makelocalsource when installing from a CD to provide installation files when the CD is not available later in the installation.

- /noreboot—Instructs setup not to restart the computer after the file copy phase of setup is completed so that you can execute another command.

- /s:*sourcepath*—Specifies the source location of the Windows XP files. To copy files from multiple servers simultaneously, type the /s:*sourcepath* option multiple times (to a maximum of eight). If you type the option multiple times, the first server specified must be available or setup will fail.

- /syspart:*drive_letter*—Specifies that you can copy setup startup files to a hard disk, mark the disk as active, and then install the disk in another computer. When you start that computer, it automatically starts with the next phase of setup. You must always use the /tempdrive parameter with the /syspart parameter. You can start Winnt32 with the /syspart option on a computer running Windows NT 4.0, Windows 2000, or Windows XP. The computer cannot be running Windows 95, Windows 98, or Windows Me.

- /tempdrive:*drive_letter*—Directs setup to place temporary files on the specified partition. For a new installation, Windows XP will also be installed on the specified partition. For an upgrade, the /tempdrive option affects the placement of temporary files only; the OS is upgraded in the partition from which you run winnt32.

- /udf:*id* [,*UDB_file*]—Indicates an identifier (*id*) that setup uses to specify how a Uniqueness Database (UDB) file modifies an answer file (see the /unattend entry). The UDB overrides values in the answer file, and the identifier determines which values in the UDB file are used. For example, /udf:RAS_user,Our_company.udb overrides settings specified for the RAS_user identifier in the Our_company.udb file. If no *UDB_file* is specified, setup prompts the user to insert a disk that contains the $Unique$.udb file.

- /unattend—Upgrades your previous version of Windows 98, Windows Me, Windows NT 4.0, or Windows 2000 in unattended setup mode. All user settings are taken from the previous installation, so no user intervention is required during setup.

- /unattend[*num*]:[*answer_file*]—Performs a fresh installation in unattended setup mode. The specified *answer_file* provides setup with your custom specifications. *Num* is the number of seconds Setup waits after it finishes copying the files before it restarts your computer. You can use *num* on any computer running Windows 98, Windows Me, Windows NT, Windows 2000, or Windows XP. Using the /unattend command-line option to automate setup affirms that you have read and accepted the Microsoft License Agreement for Windows XP. Before using this command-line option to install Windows XP on behalf of an organization other than your own, you must confirm that the end user (whether an individual or an entity) has received, read, and accepted the terms of the Microsoft License Agreement for Windows XP. OEMs might not specify this key on machines being sold to end-users.

> **Note**
>
> The WINNT and WINNT32 syntax information was taken directly from the Help information obtained by using the /? parameter for each of these commands at the command prompt.

Partitioning the Hard Disk

You might want to partition your hard disk before installing Windows XP Professional. Many people create a DOS boot partition that's accessible when booting from a floppy so they can run diagnostic software and utilities that run only on DOS. They can still store data in a more secure NTFS partition that is inaccessible unless the system is booted to Windows XP. Although it's possible to install Windows XP on a FAT or FAT32 partition, neither version of FAT provides the advanced security features of NTFS, so you must determine which file system (or which combination of file systems) is most appropriate for your needs. Chapter 4, "File Systems," discusses the criteria for choosing a file system and details the capabilities and implications of choosing file systems supported by Windows XP. For now, suffice it to say that FAT/FAT32 partitions provide no security; if you require the assignment of rights to system resources, NTFS is the file system to use. There are other deciding factors as well, as covered in detail in Chapter 4. Partition selection is covered in more detail under the "Text-Only Portion of Setup" section of this chapter.

Right now, it's important to know that the **active partition** is the partition that houses the Windows XP boot files. This is very important: if the computer doesn't know where to look for the boot files, it can't start. You can use the DOS **FDISK** utility to partition the hard disk before installation, or you can use the partitioning interface encountered during setup. Hands-on Project 2-2 walks you through the process of segmenting a single large partition into two partitions.

> **Note**
>
> The DOS FDISK utility can be used to create and delete partitions. However, it has limited capabilities with NTFS. FDISK can see and delete only primary NTFS partitions. FDISK cannot see or delete NTFS-formatted logical drives in an extended partition. The tool DELPART can be used to delete any type of partition from a hard drive, including NTFS. This tool is from the *Microsoft Windows NT 3.5 Resource Kit*. You can usually find it on the Internet through most of the search engines.

> **Note**
>
> The active partition from which the computer initially boots is termed the system partition. The system partition hosts the boot menu files. The partition where the main Windows XP OS files reside is termed as the boot partition. These terms can seem backward, but they are the official Microsoft terms. The system and boot partition can be the same partition.

ACTIVATING WINDOWS XP

Microsoft has begun a serious campaign against software piracy. As it becomes easier and easier to trade applications anonymously over the Internet, Microsoft wants to curb the number of pirated copies of its operating systems. One of the latest innovations in this area is **product activation**, a mechanism by which a product has a finite initial functional lifetime. For Windows XP, this period is 30 days, after which the product must be activated to continue functioning. The process of activation is a type of registration in which the product, its product key, and the hardware signature of your computer are correlated and enrolled in a Microsoft database. Microsoft assures us that the process of activation is completely anonymous, yet specific enough to prevent the same product key from being reused on a different computer.

Activation has both benefits and drawbacks. One benefit is that it ensures that you've purchased a fully licensed and valid product and did not inadvertently obtain a pirated copy. Unfortunately, the drawbacks of activation are many. First and foremost, if you make a significant change to your hardware, your activation can be invalidated. What constitutes a significant change has not been defined fully by Microsoft. It definitely means changing motherboards, but can also include changing a drive controller, video controller, or adding additional CPUs. In any case, you can re-activate, but you have to contact Microsoft directly by phone. A second drawback is that activation must be completed even if you don't have Internet access. Activation is quick and painless if you have Internet access. If not, you'll need to activate your product by phone. Microsoft has set up dedicated activation numbers and has included complete information on phone activation in the readme.txt file on the distribution CD and through the Activate Windows Wizard.

After the initial installation, you have 30 days to activate your product before it will no longer function fully. Afterwards, Windows XP functions only enough to allow you to complete a product activation. Windows XP reminds you every few days about activation through a pop-up window.

Activation can be completed during or after setup. It is prompted during setup as long as you don't join a domain, or it can be automated if you use an unattended setup mechanism. After setup, activation can be initiated through the Start menu. The Activate Windows command appears at the top of the All Programs section of the Start menu (before activation only) and in the All Programs|Accessories|System Tools subsection.

The Activate Windows Wizard offers three options: Activate Windows over the Internet, Activate Windows over the telephone with a customer service representative, or Don't activate Windows. The Internet option is usually completed in seconds. The second option requests your location, then provides you with a phone number. The customer service representative (CSR) asks you for the installation ID provided by the Wizard. The installation ID is a unique code of over 50 digits that corresponds to your computer system and the Windows XP product key. The CSR provides you with a 42-digit confirmation code you need to type into the Wizard interface. Once you've entered the code, clicking Next completes the activation process.

> **Note** The CSR might ask you to change your product key through the Change Product Key button. This button should be used only if instructed by the CSR.

Activation is considered mandatory. That is, it's mandatory if you want to use Windows XP for longer than 30 days. When you perform the activation process, you'll also be prompted to register with Microsoft. Registration is optional; it is simply the mechanism by which Microsoft obtains demographic information about its product users and signs them up to receive Microsoft advertisement and promotional mailings.

WINDOWS XP PROFESSIONAL SETUP: STEP-BY-STEP FROM FLOPPIES

Installing Windows XP Professional is not difficult. In fact, we think it is easier than the process for Windows 2000, and almost as simple as that for Windows 98. In any case, you should be able to perform a typical installation without a hitch. In this section, we walk through a fresh installation using the five setup boot floppies and a local CD-ROM drive, based on the following assumptions:

- Your computer's hardware is HCL-compliant and all required device drivers are found on the distribution CD.

- Your computer has no pre-existing operating systems installed.

- You have the six set-up floppies.

- You will select the default or typical settings for this installation.

- You will be using a specific IP address. You must know the IP address, subnet mask, and default gateway. If you don't know these yet, you can use 172.16.1.1 for the IP address and 255.255.0.0 for the subnet mask as working placeholders.

■ You will be a member of an existing domain. You'll need to know the name of this domain and the authentication information for an Administrator account. If a domain is not available, you can choose to join a workgroup and give it any name you want.

■ The connecting network offers Internet access to clients. This means you'll need to know your default gateway (that's the IP address of the router or proxy system acting as the gateway to the Internet). You might also need the IP addresses of one or two DNS (Domain Name System) servers from the Internet. Your network administrator or your Internet Service Provider (ISP) should be able to provide this information. See Chapter 8, "Internetworking with Remote Access," for more details on Internet connectivity. If you are using DHCP, information such as the subnet mask and DNS server(s) is provided automatically.

Now that these preparation details are out of the way, let's get started.

Text-Only Portion of Setup

The first portion of the process in a DOS setup method (see discussion earlier this chapter) occurs through a text-only interface. This section of the chapter walks you through every prompt of this portion of setup. If your system has a bootable CD-ROM drive, you can boot from the Windows XP Professional CD and skip straight to step 4.

1. Insert the first setup boot disk into the floppy drive.

2. Turn on the computer.

3. After data is copied from the first disk, you'll be prompted to insert Disk #2. Remove Disk #1, insert Disk #2, then press **Enter**. Repeat this for Disks #3, #4, #5, and #6.

4. After Disk #6, the Windows XP Professional setup routine prompts you whether to setup, repair, or quit:

```
Welcome to Setup.
This portion of the setup program prepares Microsoft (R)
Windows (R) XP (TM) to run on your computer.
* To set up Windows XP now, press ENTER.
* To repair a Windows XP installation using Recovery
Console, press R.
* To quit setup without installing Windows XP, press F3.
```

Press **Enter** to continue with the installation.

5. Setup prompts you to insert the Windows XP Professional CD-ROM into your local CD-ROM drive. Do so, then press **Enter** to continue.

6. Setup then inspects your hard drives. This should take only a few seconds.

7. Next, you'll be presented with the license agreement. Using the Page Down key, scroll through this document. Once you've read it, press **F8** to continue with the installation. If you cannot agree to the terms of the agreement, you should press **Esc** to end setup.

8. Next, setup searches for pre-existing operating systems on your computer. If any are found, you'll be prompted whether to perform a repair or to continue with a clean installation. Because we are assuming you are installing into a new system, press **Esc** to continue with a clean installation.

9. Next, you are prompted for the destination drive and partition where Windows XP Professional will be installed. Using the arrow keys, you can select either a pre-existing partition or an area of unpartitioned space. Because we assume you are installing onto a new computer, there should be only unpartitioned space. Select the unpartitioned space on the first (or only) hard drive, then press **Enter**.

> **Note**
>
> If you do not want to make the largest partition possible, then you can create a partition manually using the C command (in this context, C stands for Change the partition size). First select an unpartitioned space, then press C. You'll be prompted for the size of the partition to create. Once created, the newly created partition can be selected from the original drive and partition list. If you need to delete an existing partition, you can do so by selecting it and pressing D. You'll need to confirm this process, so be sure to read the next screen and follow its instructions. Once the partition has been deleted, the list of drives and partitions will be updated. Be careful when using this interface, because changes are made immediately to the drive's configuration.

10. Next, setup prompts for the type of file system to use when formatting the selected destination partition. The file system currently in use is the default selection. We recommend sticking with the default (format with NTFS) and pressing **Enter**.

    The list of options includes only versions of FAT and NTFS. NTFS is the recommended file system for Windows XP and supports volumes (i.e., partitions) up to 2 terabytes. Partitions up to 4 GB can be supported by the FAT file system. If a partition larger than 2 GB is used (even though its maximum volume size is 4 GB) and FAT is selected, setup automatically formats the partition with FAT32. FAT32 has the same features as FAT but can support volumes up to 32 GB (i.e., its maximum file size is still 4 GB).

    You also have the option of selecting a quick format versus the normal format. Quick format only erases the directory structure. If the destination partition was pre-formatted, you can choose the quick option. However, if you are using a new hard drive, just created a new partition, or are overwriting an existing partition, use the normal option.

11. Setup formats your selected partition. This can take considerable time for larger partitions. Once the formatting is complete, setup re-inspects the hard drive(s), builds a file list, then starts copying files from the CD. This process can take even longer than the formatting. Fortunately, both the formatting and the copying processes display a percentage completed bar.

12. Eventually, the copy process is complete. Remove Disk #5 from the floppy drive and press **Enter**. After 15 seconds, setup reboots automatically and takes you into the GUI (graphical user interface) portion of the Windows XP Professional set-up process.

> **Note**
> If your system has a bootable CD-ROM, eject the CD before rebooting. If setup needs it again before installation is complete, it will prompt for it.

GUI Portion of Setup

The second part of the installation takes place in GUI mode, in a pseudo-Windows XP environment, where you provide configuration details. It can take several minutes before the Setup Wizard appears.

> **Note**
> The following steps are a continuation of the setup process.

13. Eventually the Regional and Language Options page of the Setup Wizard appears. If you need to alter the defaults of English/United States for standards and formats, or text input languages, use the Customize and Details buttons. Otherwise, click **Next** to continue.

> **Caution**
> While working through the GUI portion of the setup, be very careful when clicking the Next button. Often the system takes several seconds or even a minute to alter the display even after you've clicked the Next button. You should click the Next button only ONCE and wait until the system responds, or at least five minutes, before re-clicking. Otherwise, you might inadvertently skip a page of the Wizard, and in some cases, you'll be unable to use the Back button. If you suspect that you have skipped a Wizard page and are unable to reach it with the Back button, you can cycle the power on your computer to restart the GUI portion of setup.

14. Next, you are prompted for the Windows product key. Carefully type it and click **Next** to continue.

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15. Next, you are prompted for your name and an organization name. Type these in the appropriate fields. You can leave the Organization field blank if you are an individual. Click **Next** to continue.

16. Next, you are prompted for a computer name and the password for the Administrator user account. Provide these in the appropriate fields. Click **Next**.

17. If a modem is present in your computer and is properly detected by setup, you'll be prompted for your area code. Provide this and click **Next**.

18. Setup prompts you to set and confirm the time, date, and time zone. Set these. Click **Next**.

19. Setup loads drivers for the networking components it has detected. You'll be prompted to either accept these default settings or change them. If you are using DHCP clients and servers, accepting the typical settings is sufficient. If you need to specify an IP address, you must select the custom settings. We assume you are using an assigned IP address, so select **Custom Settings**. Click **Next**.

20. Setup displays the name of the detected NIC near the top of the dialog box. In a center field are listed the network components: Client for Microsoft Networks, File and Printer Sharing for Microsoft Networks, QoS Packet Scheduler, and Internet Protocol (TCP/IP) (others can be listed by default as well). You need to make changes only to the protocol, so select **TCP/IP** and click **Properties**. This opens the Internet Protocol (TCP/IP) Properties dialog box. Select the **Use the following IP address** radio button, then fill in the fields for IP address (either the one you are assigned or the placeholder 172.16.1.1), subnet mask (either the one you are assigned or the placeholder 255.255.0.0), and default gateway (either the one you are assigned or leave this blank). Fill in any of the applicable optional settings and click **OK** when finished. Then click **Next** to complete the Custom Settings for Networking.

21. Next, you are prompted for the name of the workgroup or domain of which this system will be a member. Select the Workgroup or Computer Domain Name radio button, then provide the appropriate name in the text field (if a workgroup or domain on the network is detected, that name is used by default). Click **Next** to continue.

22. If you selected to join a domain, you'll be prompted for the name and password of an Administrator account in that domain. This is used to create a computer account in the domain for your new Windows XP Professional system. Provide these details, then click **OK**.

23. Setup installs and configures the remainder of the system components. This can take nearly 30 minutes.

24. If the installation routine encountered any problems, a dialog box appears offering you the opportunity to view the setuperr.log file of these errors. Click **Yes** to view it now, or click **No**.

25. Eventually, setup needs to reboot again. This can occur automatically, or you might be prompted to confirm the reboot.

26. After the reboot, you must perform a few final configuration steps. If you joined a workgroup, skip to step 32.

27. If you joined a domain, the Network Identification Wizard appears. Click **Next**.

28. The User Account page of the Network Identification Wizard can be used to create an administrative-level user account. In most cases, this is not recommended; it's better to create administrative accounts after the installation is complete. Select the **Do not add a user at this time** radio button. Click **Next**.

29. Click **Finish**.

30. The Welcome to Windows logon prompt is displayed. Press **Ctrl+Alt+Delete**.

31. The Log On to Windows dialog box appears. Provide the password for the Administrator account (the administrator user name is already provided by default), or provide both the username and password of a domain user account. Click **OK** (or press **Enter**).

32. After several minutes of processing and establishing user profile defaults, the desktop is displayed. You've successfully logged in and completed the installation of Windows XP Professional. At this point, Windows XP is fully installed; however, you still need to activate Windows XP (see the "Activating Windows XP" section earlier in this chapter).

33. Joining a workgroup results in a slightly different end-of-installation process. The Welcome to Microsoft Windows XP screen appears. An animated Wizard audibly welcomes you to Windows XP. Once the audio is complete, click **Next**. The audio welcome plays even if you do not have sound capabilities; you must wait until the introduction is complete and the Next button turns green before proceeding.

34. The system is checked automatically for Internet connectivity. No matter what is found, you'll be prompted to indicate whether the system gains Internet access through a local network (the **Yes** radio button) or must establish a dial-up connection (the **No** radio button). Assuming you have Internet connectivity through your network, select **Yes**. Click **Next**.

35. The Ready to activate Windows screen appears. Select the **Yes, activate Windows over the Internet now** radio button unless you have a specific reason not to do so. You can always activate Windows XP later from the Start menu or taskbar (see the "Activating Windows XP" section earlier in this chapter). Click **Next**.

36. The Ready to register with Microsoft screen appears. Registration is optional. Click the **No, not at this time** radio button. Click **Next**.

37. The Will you be sharing this computer with other users? screen appears. If this system will be used by several people, it is usually a good idea to define a unique user account for each of them. Select **Yes**. Click **Next**.

38. The Who will use this computer? screen appears. Type in the names of up to six user accounts to create on this system. Additional user accounts can be created later after setup is complete. Click **Next**.

> **Note**
>
> All user accounts created at this point will be computer administrators with no password defined. This can be changed later through the User Accounts applet.

39. The Thank You! page appears. Click **Finish**. The Windows XP Welcome screen appears, including a list user accounts created in step 37 and a default icon. Click one of these names to log on. After several minutes of processing and establishing user profile defaults, the desktop is displayed. You've successfully logged in and completed the installation of Windows XP Professional.

TROUBLESHOOTING AN INSTALLATION

The Windows XP installation procedure is fairly self-regulating and self-healing. In most cases, if you hit a snag, starting over or just rebooting often resolves the issue. However, in those instances when you can't seem to get the installation to work properly, you should see Chapter 15, "Troubleshooting Windows XP," and review the "Troubleshooting Installation Problems" section.

REMOVING WINDOWS XP PROFESSIONAL

Unlike most other Windows operating systems, Windows XP offers an uninstall or rollback capability; however, it is supported only when an upgrade is performed over Windows 95/98/OSR2/SE/Me. When an upgrade installation is performed over one of these versions of Windows 9x, Setup automatically creates backup files, which consume about 300 MB of drive space in addition to the 650 MB needed by Windows XP itself.

This rollback feature not only allows you to uninstall Windows XP and return to your previous OS, it also protects you during the upgrade installation. If the installation fails, setup automatically restores the system to its pre-installation attempt state. If you do not use this rollback capability after 60 days, you'll be prompted whether to retain the rollback data or delete it to free up the drive space.

To employ the rollback, you need only use the Add or Remove Programs applet. Just select the Windows XP item from the list and click the Change/Remove button. Follow the simple Wizard to confirm the removal, and after the rollback is complete, the system reboots to your previous OS.

If you did not upgrade from Windows 9x, there is no simple uninstall or rollback capability available to you in Windows XP. In fact, you have to be quite determined to remove Windows XP. Windows XP can be removed from a system in one of two ways. One option is to destroy the partition(s) where Windows XP has made its mark (i.e., the boot and system partitions), then re-partition, format, and install some other OS. The other option is available only if you installed Windows XP onto a FAT (not FAT32) partition. In this case, just delete all of the Windows XP files and rebuild the MBR (typically with the MS-DOS command FDISK /MBR). It is also a good idea to have a DOS or Windows boot disk that contains sys.com for reapplying the system files after using the /MBR switch.

Destroying Partitions

In our opinion, the easiest method to remove Windows XP is to destroy the installation and start fresh with some other OS. The first step in this process is to backup all data that you consider important; this process will most likely destroy it, especially if it is on the boot or system partitions. The remaining steps for removal are as follows:

1. Boot the computer using the set-up boot floppies or a bootable CD, as if you were installing Windows XP.

2. Continue through the same set-up steps as described earlier in this chapter.

3. Once you reach the step that prompts you for the destination drive and partition, use this interface to delete all partitions (or at least all NTFS partitions). Use the arrow keys to select each partition, press D to delete, then L to confirm. Once all partitions are deleted, press F3 to exit. You'll have to confirm the termination of setup by pressing F3 again.

4. At this point, you computer's hard drive is not partitioned. Use a DOS disk or a Windows 95/98/NT installation boot disk to start the installation process for another OS.

> In addition to setup's built-in capabilities for deleting partitions, you could also employ another Microsoft tool, DELPART (as mentioned earlier in this chapter).

CHAPTER SUMMARY

❑ In this chapter, you learned how to install and uninstall Windows XP Professional and became acquainted with all the tools and information necessary. At this point, you

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should understand how to choose hardware for a successful installation, how to install Windows XP both locally and across the network, how to use the switches that come with WINNT and WINNT32, and how to run setup. You should also be familiar with the differences between upgrading and installing Windows XP, and what those differences mean in terms of the information you must provide during setup.

KEY TERMS

active partition — The partition the computer uses to boot.

activating Windows — A new Microsoft requirement to prevent software piracy by registering installations of Windows XP with the signature of its supporting hardware.

answer file — A text file, also called a response file, that contains a set of instructions for installing Windows XP.

boot loader — The software that shows all operating systems currently available and, through a menu, permits the user to choose which one should be booted.

BOOT.INI — The text file that creates the Windows XP boot loader's menu.

clean installation — The installation method in which an OS is installed without regard for pre-existing operating systems. In other words, all settings and configurations are set to the OS defaults.

DOS prompt — The common name for the command-line window available from DOS and Windows.

dual–boot system — A computer that is configured to use two operating systems.

FDISK — A DOS utility used to partition a hard disk. The DOS FDISK tool can see and manipulate only primary NTFS partitions; it cannot even view logical drives in an extended partition formatted with NTFS.

file system — The method used to arrange, read, and write files on disk. Windows XP supports the NTFS, FAT, and FAT32 file systems.

format — Rewriting the track and sector information on a disk, it removes all data previously on the disk.

multi–boot system — A computer that hosts two or more operating systems that can be booted by selecting one from a boot menu or boot manager during each bootup.

network adapter (NIC) — Another name for network card; the piece of hardware that enables communication between the computer and the network.

new installation — See *clean installation*.

partition — A space set aside on a disk and assigned a drive letter. A partition can take up all or part of the space on a disk.

product activation — A mechanism by which a product fails if not registered within a specified time period. To be activated, a product must be registered with a correlated product key and hardware signature.

setup boot disks (or **floppies) —** The disks used by Windows XP to initiate the installation process on computer systems that do not have an existing OS, do not have a CD-ROM that supports bootable CDs, or do not have network access to a Windows XP distribution file share. These disks can be created by running the MAKEBOOT file from the BOOTDISK directory on the distribution CD.

Setup Manager — The Windows XP tool that provides you with a GUI for creating an answer file.

SYSPREP — The Windows XP utility used to clone a system.

SYSDIFF — The Windows XP utility used to take a snapshot of a basic installation and, after changes have been made, record the changes and apply them to another installation.

unattended installation — A Windows XP installation that uses a script and does not require user interaction.

uniqueness database file (UDF) — A text file that contains a partial set of instructions for installing Windows XP; used to supplement an answer file, when only minor changes are needed that don't require a new answer file.

upgrade — The installation method in which data and configuration settings from the previous operating systems remain intact. The level or amount of retained data varies based on the existing operating system's type.

WINNT — The 16-bit Windows XP installation program.

WINNT32 — The 32-bit Windows XP installation program.

REVIEW QUESTIONS

1. Windows XP can be installed onto a computer system in a multi-boot configuration with what other operating systems without requiring special third-party software? (Choose all that apply.)

   a. DOS

   b. OS/2

   c. Linux

   d. Windows 95

   e. Windows 2000

2. Microsoft supports only problems caused by hardware not on the Hardware Compatibility List. True or False?

3. Which of the following operating systems can be upgraded to Windows XP Professional? (Choose all that apply.)

   a. Windows 3.x

   b. Windows for Workgroups 3.x

   c. Windows XP Home

   d. Windows 98

   e. Windows NT 4.0 Workstation

   f. Windows 2000 Server

   g. Windows 2000 Professional

4. Data stored on a partition formatted with FAT32 are accessible only from Windows XP. True or False?

5. Which of the following is the correct location for the x86 installation files on the installation CD?

   a. The root directory of the CD

   b. \SUPPORT\I386

   c. \INSTALL\I86

   d. none of the above

6. When sharing an installation folder across the network, you should assign it _____ permission. (Fill in the blank.)

7. Which of the following situations allow a floppyless installation? (Choose all that apply.)

   a. The network is not yet functioning.

   b. The hard disk for the computer on which Windows XP is being installed is not yet formatted.

   c. No CD drivers are present for the existing OS.

   d. Windows 95 is already installed on the computer.

8. Windows XP can be installed with only the CD-ROM if the computer's hardware is properly configured. True or False?

9. How are setup floppy disks created?

   a. WINNT32 /OX

   b. MAKEBOOT

   c. WINNT32 /B

   d. Download the creation utility from the Microsoft Web site.

10. The DOS utility used to create and delete partitions on a hard disk is called _____. (Fill in the blank.)

11. Windows XP must be installed on an NTFS partition. True or False?

12. Which of the following statements is true? (Choose all that apply.)

    a. The entries in a uniqueness database file override those in an answer file, when the two are used together.

    b. An answer file is used to script text-mode Setup, while a UDF scripts GUI-mode setup.

    c. If you have several installations to complete that differ only in the user name, then you can use an answer file to customize the settings in the UDF.

    d. Answer files can be created using the Setup Manager Resource Kit tool.

13. The maximum volume size for FAT32 partitions is 2 terabytes. True or False?

14. What file system can be used on a installation destination directory for Windows XP Professional if the partition is 4 GB in size?

    a. FAT

    b. FAT32

    c. NTFS

15. When removing Windows XP, all NTFS partitions can be deleted with just FDISK. True or False?

16. Which of the following commands is used to record the original state of a Windows XP installation?

    a. SYSDIFF /APPLY

    b. SYSDIFF /DIFF

    c. SYSDIFF /INF

    d. SYSDIFF /SNAP

17. Running _____ creates a text record of a SysDiff difference file. (Fill in the blank.)

18. To map a network drive from a DOS computer, which command will you use?

    a. NET START

    b. NET LOGON

    c. NET USE

    d. NET CONNECT

19. The _____ WINNT32 switch is used to prevent Dynamic Update from running. (Fill in the blank.)

20. At what point in the installation do you have the option of converting the file system to NTFS?

    a. After selecting the installation partition.

    b. After the EULA has been agreed to.

    c. At the end of the GUI-mode portion of installation.

    d. You must convert the partition after setup has completed.

21. The UNATTEND.TXT file included as a sample on the Windows XP Professional CD can be used 'as is' to perform an upgrade of Windows NT Workstation. True or False?

22. Unattended or automated installation scripts can be created that can perform which of the following functions? (Choose all that apply.)

    a. Duplicate an existing system's configuration

    b. Create a read-only installation where viewers can step through the installation but not make any configuration changes

    c. Automate only the GUI portion of setup

    d. Provide custom defaults but allow installer to change settings

    e. Duplicate the settings of a Windows NT Workstation system

23. No matter from which OS you launch a network installation of Windows XP, what is the one action you must perform?

    a. Install TCP/IP

    b. Map a network drive to the Windows XP share

    c. Pre-format a 4 GB partition with FAT32

    d. Use SYS C: to repair the MBR

24. You're preparing for a network installation of Windows XP. Which of the following is not required to accomplish this? (Choose all that apply.)

    a. Copy the \SUPPORT directory from the installation CD to the server supplying the installation files.

    b. Share the installation directory with Read permissions.

    c. Boot the destination client computer onto the network.

    d. Run WINNT32 /N on the network server.

25. You want to change the menu description for Windows XP in the boot loader's menu. What file will you edit to make the change?

    a. DOSNET.INF

    b. UNATTEND.TXT

    c. BOOT.INI

    d. WINNT.INI

HANDS-ON PROJECTS

Project 2-1

To make the Windows XP Professional installation files available for network installations from a Windows 2000 Server computer:

1. Using an Administrator account, log onto the Windows 2000 server computer that will be sharing the files.

2. Insert the Windows XP Professional installation CD-ROM into the drive on the server. The autorun mechanism should open the CD splash screen and may prompt you whether to upgrade. Click **Exit** to close the splash screen.

3. Launch Windows Explorer (**Start|Programs|Accessories|Windows Explorer**).

4. Select the CD-ROM drive icon in the left pane.

5. Locate the \i386 directory in the right pane. Drag and drop the I386 directory to the C: drive icon in the left pane (or another hard drive with at least 500 MB of free space).

6. This copies the entire directory to your hard drive. Once the copy process is complete, select the I386 folder on the hard drive and right-click it. Select **Sharing** from the pop-up menu.

7. Select the **Share this folder** radio button. Provide a share name, such as **WXPPro** (see Figure 2-3).
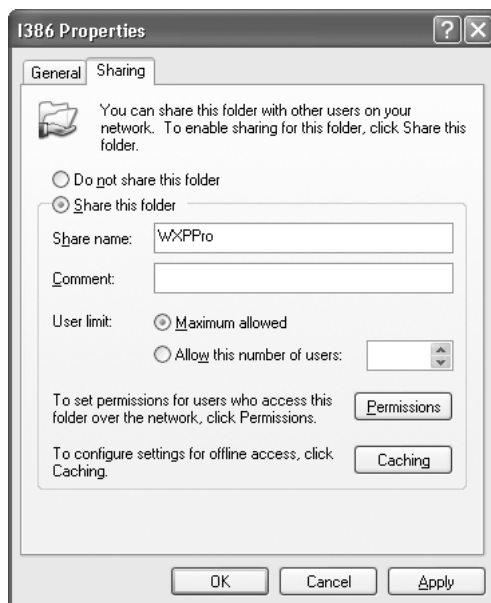

Figure 2-3 Creating a network share

8. Click **Permissions**, click **Add**. Locate and select the **Everyone** group, click **Add**, then **OK**.

9. While the Everyone group is highlighted in the Permissions dialog box, set the access permissions to **Allow Read** (see Figure 2-4). Click **OK** to close the Permissions dialog box. Click **OK** to close the Sharing dialog box.
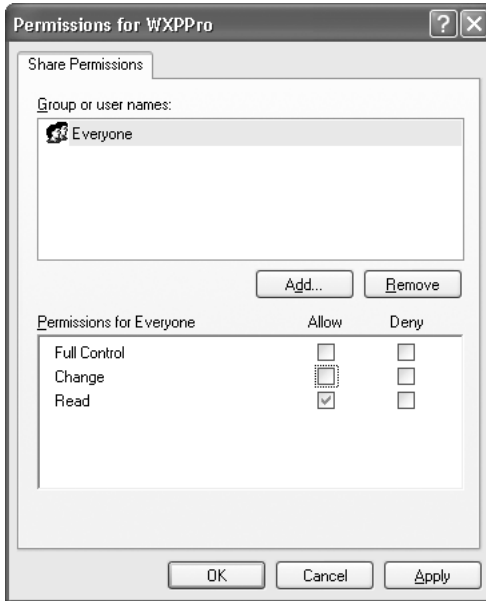

Figure 2-4   The Share Permissions dialog box

Project 2-2

To use the FDISK utility to divide the hard disk into two partitions:

Back up any data currently on the disk before repartitioning it! FDISK (or any partitioning utility) permanently destroys any data currently on the hard disk.

1. Boot the computer to DOS by selecting it from the boot menu or using a DOS boot disk.

2. Move to the directory containing the FDISK utility. (To find it, type **DIR FDISK.* /s** to search all subdirectories on the current disk.)

3. Type **FDISK** and press **Enter** to start the utility. When FDISK starts, you will see a menu of the following four options:

   ❑ 1 Create DOS partition or Logical DOS Drive

   ❑ 2 Set active partition

❐ 3 Delete DOS partition or Logical DOS Drive

❐ 4 Display partition information

> **Note**
> If your computer has more than one hard disk, you'll see a fifth option, "Change current fixed drive." Additionally, you may get a prompt that states "Your computer has a disk larger than 512MB. Do you wish to enable large disk support?" Click Yes and continue with the following steps.

4. Type **4** and then press **Enter** to view the partitions currently on the hard disk. In this example, it is assumed that you'll see a single primary DOS partition. After reviewing the information, press **Esc** to return to the main menu.

5. Once at the main menu screen, type **3** and press **Enter** to delete the primary partition. When asked which partition to delete, type **1** and press **Enter**.

6. When prompted, type the volume label (if any) for the partition you're deleting. The label is listed at the top of the screen with other volume information. If there is no volume label, just press **Enter**.

7. Type **Y** and press **Enter** to confirm the deletion of the selected partition.

8. Press **Esc** to return to the main menu.

9. From the main menu, type **1** and press **Enter** to choose to create a DOS partition.

10. Type **N** and press **Enter** when asked whether you want to use the maximum available space. When prompted, type in the size (in megabytes) or percentage of disk space of the partition you want to create and press **Enter**. For installing Windows XP, a drive size of 2 GB or more is recommended.

11. From the main menu, type **2** and press **Enter** to set the active partition. When prompted, type **1** to choose the partition you just created.

12. Press **Esc** to return to the main menu, then **Esc** again to exit FDISK.

13. Reboot the computer. You'll need to install an OS (such as Windows XP) to format the partition.

> **Note**
> It's unnecessary to partition the remaining space on the drive now; you can do that while installing Windows XP.

Project 2-3

To install the Windows XP Support Tools:

> **Note**
> You must be logged on with Administrator privileges to complete this project.

2

1. Insert the Windows XP Professional CD into the CD-ROM drive. The autorun mechanism should open the CD splash screen and prompt you whether to upgrade. Click **No**, then click **Exit** to close the splash screen.

2. Open the Run dialog box (**Start|Run**).

3. Click **Browse**.

4. Locate the CD-ROM drive, find the \Support\Tools directory, select **SETUP.EXE**, then click **Open**.

5. Click **OK** to execute the installation.

6. The Windows Support Tools Setup Wizard appears, click **Next**.

7. Click **I agree** to accept the End User License Agreement.

8. Provide your name and organization name (if applicable), click **Next**.

9. Select the **Typical installation method** (it's the default), click **Next**. The Complete option installs every available tool and is more suited for administrators. The default installation path is \Program Files\Support Tools.

10. Click **Install Now** to start the installation.

11. When copying completes, click **Finish**.

Project 2-4

To create an answer file for an unattended installation, use the Setup Manager Wizard from the *Microsoft Windows XP Professional Resource Kit* included on the Windows XP Professional distribution CD:

> You must be logged on with Administrator privileges to complete this project.

1. Insert the Windows XP Professional CD into the CD-ROM drive. The autorun mechanism should open the CD splash screen and prompt you whether to upgrade. Click **Exit** to close the splash screen.

2. Launch Windows Explorer (**Start|Programs|Accessories|Windows Explorer**).

3. Open the \Support\Tools folder on the Windows XP distribution CD.

4. Double-click the **DEPLOY.CAB** file.

5. Double-click **SETUPMGR**.

6. The Select a Destination dialog box appears (see Figure 2–5). Expand **My Computer** and select drive **C**.

Figure 2-5   The Select a Destination dialog box

   7. Click **Make New Folder**, name it **setupmgr**.

   8. Click **Extract**.

   9. Open the \setupmgr folder you just created through Windows Explorer.

 10. Double-click **setupmgr** to launch the Windows Setup Manager Wizard.

 11. The Windows Setup Manager Wizard launches, click **Next**.

 12. Select **Create a new answer file** (the default; see Figure 2-6), click **Next**.
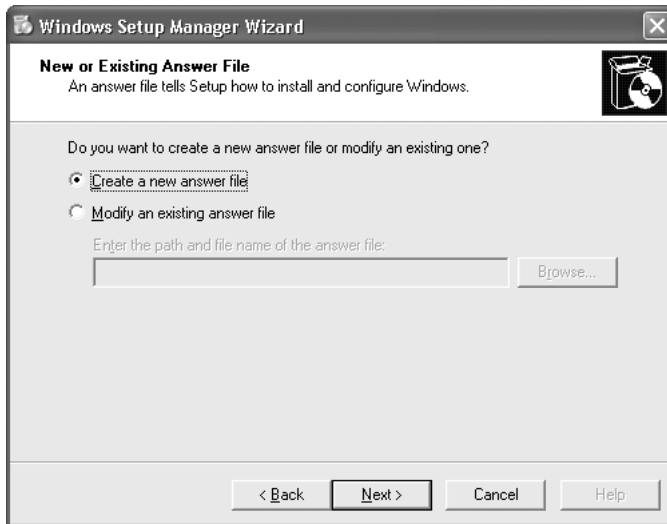

Figure 2-6   The first screen of the Windows Setup Manager Wizard

13. Select **Windows Unattended Installation answer file**. Click **Next**.
14. Select **Windows XP Professional**. Click **Next**.
15. Select **Fully automated** (see Figure 2-7). Click **Next**.

Figure 2-7 Selecting the User Interaction Level

16. Select **No, this answer file will be used to install from a CD**. Click **Next**.
17. Mark the checkbox to accept the license agreement. Click **Next**.
18. Provide a name and organization for the answer file. Click **Next**.
19. Proceed through the remainder of the settings screens by providing the requested information or selections and clicking **Next**.
20. Once you reach the Additional Commands page, click **Finish**.
21. Provide the path and filename for the answer file, click **OK**.
22. The answer file is saved. To create a new file, select **New|File**.
23. To edit an existing answer file, select **File|Open**.
24. To close the wizard, select **File|Exit**.

CASE PROJECTS

1. You're in charge of organizing the installation of Windows XP Professional onto a number of networked computers that currently host only DOS. Some of these computers will have applications in common, but not all of them, and you'll need to set user names and computer names for each installation. You've got a lot to

take care of, so you'd like the installation to go as quickly as possible. Which of the following will you use? Choose all that apply, and justify your choice(s).

a. An answer file

b. A uniqueness database file

c. SYSDIFF

d. WINNT32

2. Describe the five types of answer files that can be created by the Setup Manager Wizard from the *Microsoft Windows XP Professional Resource Kit*. Also, describe a scenario for each type of answer file that explains why that type is best suited for the situation.